

WHY THE SURVIVORS SURVIVED: EXAMINING THE  
CHARACTERISTICS OF ONLINE COMPANIES  
DURING THE DOT-COM ERA

By

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## ABSTRACT

This paper examines the dot-com bubble and the characteristics that enabled certain online companies to survive the crash in March of 2000. The purpose of the study was to examine financial data to understand what enabled certain companies to survive the dot-com bubble, while other companies with seemingly similar characteristics did not. The past few years sparked debate amongst investors on whether or not another bubble formed among technology companies such as Facebook, Amazon, Tesla, and Netflix. Currently, the world is in the middle of a technology boom. Investors care about the future success of technology companies that have a lot of promise baked into their stock price. My thesis attempts to examine the dot-com bubble that “burst” in March of 2000 and the companies that were able to withstand the crash until 2005. My results reveal a few conclusions about the companies in the dot-com era including (1) companies with negative earnings had a lower chance of survival; (2) companies with “.com” had a lower chance of survival; (3) companies with more volatile stock prices had a lower chance of survival; (4) companies that had higher advertising expenses had a lower chance of survival; (5) companies with higher shares outstanding had a higher chance of survival and; and (6) companies with pure online operations had a lower chance of survival.

## **Part I: Introduction and the Research Question**

The thesis will examine what the dot-com bubble was, how a bubble forms in the market, and the characteristics that enabled certain online companies to increase their chance of survival. The characteristics I utilized to determine how the surviving companies withstood the dot-com burst included: earnings, revenue, company name, assets, price volatility, advertising expense, debt, market capitalization, book value, common shares outstanding, business structure, and liabilities. I ran a linear regression to arrive at a conclusion of which characteristics factored into the chance of survival for each company in my sample.

Before running my linear regression, I researched other work on the dot-com bubble. Other research on the dot-com era consists of IPO pricing at the time and overvaluation of tech companies in the 1990s and early 2000s. A few researchers examined characteristics that played a role in a company's failure. However, the other works completed did not focus on comparing surviving companies to failing companies. Additionally, the characteristics I tested differed from previous characteristics examined by researchers. Recently, scholars investigated the difference in the dot-com bubble of 2000 versus the tech boom occurring today in the market. Goodnight and Green (2010) from "Rhetoric, Risk, and Markets: The Dot-Com Bubble" define an economic bubble as "extreme price deviation away from the fundamentals that are constituted by economic factors such as cash flows and discount rates that together determine the price of an asset" (p. 117). Historically, when investors deviate too far from the fundamentals, the market corrects, revealing flaws in pricing an asset based off of sentiment. The dot-com bubble of the 2000s was a "mass euphoria" for online companies that did not hold any

true value at the time but appeared as if they would grow to hold a lot of value for investors.

Characteristics of online companies are relevant to a variety of stakeholders. Today's market environment resembles the mid to late 1990s in more than one way. Interest rates are at historically low levels; the market fears a weak dollar, and the economy possesses rising inflation (Huddleston, 2015). Many financial analysts believe the current market environment is similar to that of the dot-com era. For example, on March 20, 2000, *Barron's* published an article titled "Burning Up," referring to the dot-com stocks and how the majority of them would "burn" through their cash in 12 months at the rate they were progressing (Willoughby, 2000). Then, on January 26, 2018, *Barron's* published an article titled "The Market's Rise Makes the Dot-Com Bubble Look Sane" (Levisohn, 2018). In today's stock market, P/E ratios are very high compared to historical averages, and investors rationalize higher valuations on companies, such as Amazon and Tesla, which do not have traditional "value" (Houston, James & Karceski, 2006). The topic this manuscript explores is still relevant today. Market stakeholders should understand past market bubbles and company characteristics that negatively affect their chance of successful investments.

The knowledge this thesis attempts to provide to the broader community is that certain companies put themselves in a more vulnerable position, if the market corrected. Specifically, the question I want to answer is, "What characteristics correlated to the success or failure of online companies during the period 1998 through 2005?" In the year 2017, the stock market saw the second longest bull market on record that did not see at least a 20% drop in the S&P 500 (Santoli, 2017). Investors have their eyes on stocks,

such as Amazon and Tesla. These companies have astronomical valuations without strong earnings to justify the valuations. Other companies like Facebook, Apple and Netflix, whose shares increased greater than 50% as of November 2017, do have real earnings, but investors are still concerned over the high valuations (Shell, 2017). The NASDAQ was on track in 2017 to have the best year since it increased 86% in 1999 (Shell, 2017). Investors rationalize the high stock prices on the basis of the company's potential. Investor rationale in the early 2000s got many investors into trouble (Cukier, Hodson & Ryan, 2009). The information that this manuscript attempts to provide will not only be useful when looking back at the dot-com era but also applicable to today's stock market. In order to truly understand the dot-com era, I developed a greater understanding of the market in the 2000's.

Previous research pertaining to the dot-com era looked into factors that acted as a catalyst for the bubble burst. Many researchers explored the idea of valuation, the Dot-com Bubble, and IPO Pricing. David Kirsch, Brent Goldfarb, and David Miller (2006) discovered the idea of the "get big fast" business strategy (p. 50). The GBF strategy is the idea that companies grew rapidly without real earnings or a solid business plan and, as a result, were more likely to fail. The dot-com era was the start of this "get big fast" strategy. Additionally, "A Rose. Com by Any Other Name" (Cooper, Dimitrov, & Rau, 2001) found that a positive price reaction occurred during the announcement of corporate name changes to Internet related dot-com names. The research completed for both articles was important in how I thought about structuring my own research. I will examine these works as well as many others in Part II or the Literature Review section. Part III consists of the methodology of the research and the results of the research

conducted. Next, Part IV discusses the conclusions and findings as well as the limitations of this thesis and provides suggestions for next steps and future studies. Part V will follow and contain implications of this thesis and how the findings are relevant. The information found through this study is impactful only if it has relevance to today's investors and markets. This section will provide further evidence that the findings are useful beyond this thesis. Finally, Part VI will conclude this manuscript by summarizing the previous sections and main takeaway points. Part VII will be a list of references that I utilized in the creation of this thesis.

## **Part II: Literature Review**

In order for a bubble to burst, a catalyst causes the excitement for the stock market to run and another catalyst to worry investors enough to question their investments. In 1992, Bill Clinton and Al Gore wanted to redirect funds to develop an “Informational Superhighway”; this highway would help bring computers to the US and increase technology. The idea of spreading technology and bringing a digital world to the American people spread like wildfire. This “new age” created the idea that any company with the ability to operate online would be successful. Investors believed that this new market of internet companies would “suit the imagined world of open-ended expansion” (Goodnight & Green, 2010, p. 117). In August 2000, 54 million households, or 51% of households, had one or more computers. Fifty-four percent was up from the 42% of households that had computers in December 1998 (Newburger, 2001). The rise of computers contributed to the new age of technology. Investors began to notice investment opportunities that were available as a result of the rise of technology (Razi & Siddiqui, 2004). In 1999, a search for “Internet” and “Stock” in the Lexis-Nexis database returned

more than 1,000 articles (Cukier & Ryan, 2009, p. 1). By the start of 2000, the number of articles for the same search words reached 1,400 (Cukier & Ryan, 2009, 2). The buzz surrounding the internet era and stocks contributed to the increase in investor money to internet related stocks.

However, in 2000, volatility began to expose the “weak” links in the stock market. The NASDAQ, which tracks the performance of technology stocks as a whole, peaked at 5,132 on March 10, 2000, more than 500% above where it stood on August 9, 1995 (Goldfarb, Kirsch & Miller, 2006, p. 103). On September 23, 2002, the NASDAQ closed at 1,185. The drop in the NASDAQ was an 18 month decline of stock prices that caused a market value loss of \$4.4 trillion. The loss included a \$1 trillion loss in 150 of Silicon Valley’s largest companies (Goldfarb, Kirsch & Miller, 2006, p.103). Equity researchers attribute the large sell off that followed this peak to the interest rate hike of 1.75 percentage points in 1999 to 2000 (Mills, 2001). Another contributor could have been the statement issued by Clinton and Gore regarding how scientists should have free access to research mapping the human genome. The statement caused biotech stocks to take a hit (Mills, 2001). Confidence began to get shaky, and in April 2000, the internet index lost 19% of its value. By the end of 2000, 60% of the equity values of Internet companies were lost by the end of the year (Goodnight & Green, 2010, p.118).

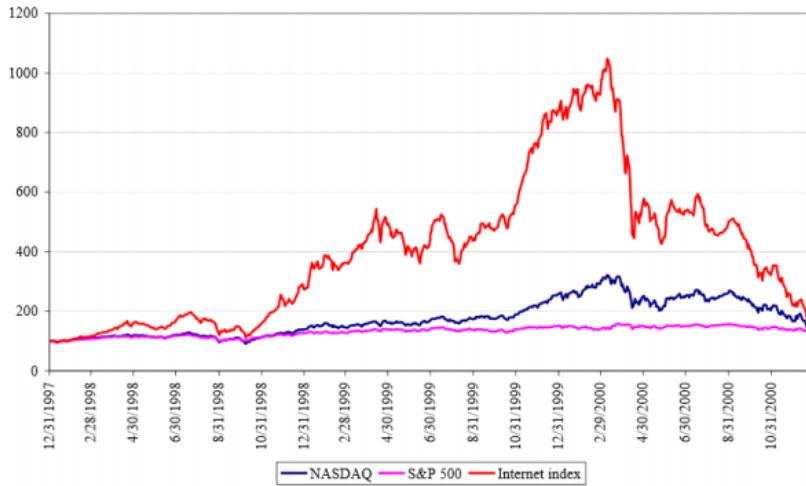
Despite the chaos on Wall Street, the dot-com bubble burst did not cause a major uproar in Washington, unlike the financial crisis of 2008 (Munro, 2001). The Great Depression and financial crisis of 2008 caused legislators to reevaluate the structure of business and the financial system as a whole (Mills, 2001). The dot-com era differed from other financial crises in that legislators did not see a way to prevent the burst, even

with additional laws in place. Wall Street managers and legislators alike did not feel any new regulations put in place could prevent another dot-com bubble from forming and bursting. As Munro (2001) wrote, “the dot-com success story began in the 1990s and was fueled by a rush of investment money and hopes of revolutionary new business opportunities” (p. 27). Federal Regulation requires that public companies make public their financial statements. Although these statements for many of the internet companies told a troubling story, investors overlooked it and still invested. Alan Greenspan, the chairman of the Federal Reserve, forewarned investors stating that the market showed “irrational exuberance” (as cited in Munro, 2001, p. 32). However, investors still flooded the market to invest their money in the new age of stocks. Munro’s work (2001) confirmed the idea that Washington was not at fault for the dot-com bubble burst. While legislation was not a contributor to the bubble burst, researchers explored the idea that IPO pricing played a role in growing the dot-com bubble.

In “IPO Pricing in the Dot-com Era,” Ljungqvist and Wilhelm (2003) suggest that IPO pricing played a major part in the dot-com bubble burst. Initial public offerings (IPOs) of dot-com companies generated outrageous returns on the opening day for companies. In 1996, first-day returns IPOs averaged ~17%, 1999 the average was ~73%

(Ljungquist & Willhelm, 2003, p. 1). Figure 1 depicts the NASDAQ returns relative to the Morgan Stanley Internet Index that consists of 29 Internet Stocks and the S&P (Ofek &

*Figure 1: Returns from 1997 to 2000*



*Source: Ofek, E., & Richardson, M. (2003) 1*

biotechnology companies. The NASDAQ does not purely consist of internet companies; therefore, the Morgan Stanley Internet ETF is an accurate representation of what occurred amongst the pure Internet companies during the bubble. The Internet index lost 19% of its value in April 2000 alone; at least 60 percent of the equity values of Internet companies were lost by the end of the year; more than 140 internet companies were trading at two dollars a share or below and more than half below five dollars (Ofek & Richardson, 2003). The market value of Internet companies that went through IPOs declined from \$1 trillion in March 2000 to \$572 billion in December (Ljungqvist & Wilhelm., 2003, p. 727). Around 800 internet companies disappeared (Ljungqvist & Wilhelm, 2003). SS&C was one tech company that, despite its profitable business, got dragged down by the crash of the NASDAQ (Wang, 2016). The founder of SS&C, Bill Stone, explained in *Forbes* that he was confused on how his business failed, despite its slow pace of growth (Wang, 2016). Even with a strong business, S&C went from 610

Richardson, 2003).

The NASDAQ Composite consists of more than 3,000 stocks that are the world's foremost technology and

employees in June 1999 to 250 in December 2001 (Wang, 2016). Luckily, SS&C was bought out by the Carlyle Group in 2005. Carlyle Group was able to restructure the company and take SS&C public again in 2010 (Wang, 2016). Other companies were not as careful during the dot-com era and grew their business rapidly, failing faster and worse than SS&C's business did. Many fast-growing companies did not get the opportunity to find a buyer to save its business before they failed.

A major headwind for dot-com companies was their pace of growth. Naïve management, coupled with eager investors, contributed to the fast expansion of company business models. Unfortunately, the majority of companies could not keep up with the speed of growth and failed from a disorganized business model and debt. Goldfarb, Kirsch, and Miller (2006) explore an interesting fact related to the dot-com era in their research. The first of their “stylized facts” reads:

There was a prevalent belief that a Get Big Fast (GBF) business strategy was appropriate for Internet businesses. This strategy fell from favor only after the resolution of the uncertainty about its efficacy in early 2000... The GBF strategy, in which firms tried to accumulate market share aggressively, was based on the presumption of a significant first mover advantage in Internet markets. First movers, it was believed, would preempt later entrants, establish preferred strategic positions, and thereby secure supernormal long-term returns. A necessary corollary of early entry was rapid expansion. Firms following a GBF strategy tried to grow aggressively and make substantial investments to both acquire customers and preempt competition. (Goldfarb, Kirsch, & Miller, 2006, p.102)

A perfect example of the GBF strategy was Netscape. Netscape had its IPO even though the company did not exhibit proven earnings or have any operational experience. During the day of the IPO, the stock price increased from its initial \$28 dollar offering to \$71 dollars (Luo & Mann, 2011). The founders of Netscape introduced the idea of a young, smart, cool, and open to sharing CEO. This new era of founders helped to draw excitement for internet startups (Luo & Mann, 2011). Netscape went public with only 1/10 of the earnings that Microsoft had at the time the company had its IPO (Goldfarb, Kirsch, & Miller, 2006). However, for the new wave of startups and venture capitalists who invested in the companies, the goal was to “get big fast” by using venture capital and money gained from initial public offerings (Goodnight & Green, 2010). Investors began to throw out fundamental analysis, and the stock prices of these online companies began to climb higher.

Other researchers developed their own hypothesis for companies in operation during the dot-com bubble. Janet Rovenpor (2003) studied the reasoning behind why so many internet based businesses failed. She found that 44% of the failed firms in the sample filed for their IPOs in the pre-bubble period, while 48% filed for their IPOs in the bubble period (Rovenpor, 2003). She stated that other variables to consider are firm age and firm size (Rovenpor, 2003). Ravonpor also found that while board size and IPO date were significant factors, comparison of surviving firms with failed firms to draw observations between the two groups with variables of interest was also important. Her research played a critical role in my own research as I thought about important variables to consider.

Research by Cooper, Dimitrov and Rau (2001) discovered a positive price reaction occurred when a company added .com to the company name during the dot-com era. The researchers call the positive price reaction the “dot-com effect” (Cooper, Dimitrov & Rau, 2001, p. 2370). Changing the name caused the company to generate returns on average of 74% for the ten days after the announcement. No evidence existed that a name change created a negative impact in the ten days following the change. The price reaction occurred even if the company had no business operations online. A simple name change caused the 74% increase in price regardless (Cooper, Dimitrov & Rau, 2001). The researchers’ sample consisted of pure internet companies and companies that previously operated on the internet, companies that changed to internet-related from non-internet related, and then companies that did not have any internet operations (Cooper, Dimitrov & Rau, 2001). My idea to research a company’s name change during the dot-com era originated from the work done by Cooper, Dimitrov and Rau. Additionally, the researchers’ work inspired my own research by providing the idea to look deeper into a company’s business model.

### **Part III: Methods and Results**

I used data from the Wharton Research Data Services in order to draw a conclusion to the question: “What characteristics enabled certain online companies to survive the tech bubble in 2000?” I did not utilize interviews and surveys in order to research the material for this manuscript. Numerical data allowed me to construct the sample I used in order to then complete a T-test. I was able to see which variables related to whether or not an online company survived or died during the dot-com bubble burst.

First, I selected the companies to include in my sample. In order to do this, I pulled the SIC codes of Amazon (AMZN) and eBay (EBAY). A SIC code is the four digit code assigned by the U.S. government to businesses in order to identify their main business. The code allowed me to pull a large amount of companies all at once in the Wharton Research Data Services that related to my study. I specifically used Amazon and eBay because these two companies operated online in 1998. Amazon's SIC code is 5961 (catalog and mail-order houses), and eBay's SIC code is 7389 (Business Services, Not Elsewhere Classified). The Wharton Research Data Services made aggregating data for each company possible. I utilized the gathered data to find all of the companies that possessed the same SIC codes. Then, I put the companies in an Excel file to begin the process of creating my final sample size.

I drilled down the data so that I only included companies in operation between the years 1998-2005. If a company did not stay in business until 2005, the company did not survive the bubble burst or “died.” Any company that lasted until 2005 survived the crash. I selected the date range of the data I gathered with March 10, 2000, in mind. March 10, 2000 was the date the dot-com bubble burst. Many companies had their IPO before the bubble burst as young entrepreneurs rushed to take their company public and take part in the stock market craze. The companies that started after March 10, 2000, I discarded because they were not present during the actual dot-com burst. If the company died after 2005, then I said the company survived the dot-com crash and other factors unrelated to the dot-com bubble burst caused the failure of the company. Other studies of the dot-com crash may utilize a different date range. For this study, I concluded that a 7 year time horizon provided the amount of data needed to draw a conclusion.

I utilized the SIC codes previously mentioned for the initial data pull. The outputs included the company name, ticker, and unique permanent security identification number (PERMNO). I put this first list of all companies with either the SIC code of 5961 or 7389 into an Excel file. Then, I researched each company's operations utilizing Bloomberg. I eliminated companies from my sample by removing duplicates, companies that did not meet the date requirements, and companies that had no online operations. Therefore, from the initial 300 companies, I pulled from the Wharton Research Data Services, 180 eligible companies remained in my sample (refer to A1).

From the list of 180 companies, I extracted the PERMNOs and created a document with the PERMNOs of my sample. I uploaded the document to the Wharton Research Data Services CRSP Compustat page to then extract more detailed data for each company. From there, I extracted earnings per share, revenue, market capitalization, total assets, high annual stock price, low annual stock price, advertising expense, total debt, book value, current liabilities, and shares outstanding for each company between the years 1998 – 2005. I utilized the information to form my X variables for the regression. The Y variable or dependent variable tracked whether the company survived the dot-com bubble burst or died. I selected the various X variables based on hypotheses I had for each variable and how it affected the companies in my sample (refer to Appendix A3). The X-Variables utilized in the study are found in Appendix A3.

One of my hypotheses was if a company had negative earnings, it was more likely to fail during the dot-com era. One of the main drivers of stock price is company earnings. Today, companies such as Amazon, Netflix, and Tesla have negative or very low earnings compared to their sales numbers. Despite poor earnings performance,

Amazon, Netflix, and Tesla are rewarded by investors in the market and as a result have high stock prices. A hypothesis that tests for positive earnings appears obvious; however, I wanted data to back up the idea that negative earnings are highly correlated to company failure. Revenue was another variable which I hypothesized Revenue is the number that tracks a company's sales. Therefore, a company can have positive revenue but negative earnings. I added revenue as an X variable to establish if not only lower earnings, but also lower revenue, negatively affected online company performance during the dot-com era. For market value, I hypothesized that a greater market value would increase a company's chance of survival. Typically, a higher market value means either more shares outstanding, or a higher stock price, or a combination of both.

I also included asset turnover as an X variable to test the hypothesis that a higher asset turnover would increase a company's chance of survival. I knew that some companies in the dot-com era had very high IPO values based on my research. Price volatility was a variable that enabled me to test if the online companies in my sample had extreme price fluctuations and whether that helped or hurt the company. I had advertising expense in my X variables so that I could see if the higher advertising expense correlated with the failure of online companies. During the dot-com era, new companies developed a reputation for spending large amounts of money on advertising to kick start business. Many companies had little or no earnings; therefore, I hypothesized that the larger amount the company spent on advertising, the less likely the company was to survive.

I also wanted to focus on the amount of debt online companies had. Based on my research, I knew that online companies financed operations with equity. I also wanted to develop an understanding for the entire capital structure of the company. To develop an

understanding of how a company was financed, I tested the X variables: total debt/market cap, debt/equity, and total debt. Testing X variables involving debt could provide a glimpse of whether or not debt affected a company's chance of survival.

In addition to analyzing the effects of debt, I hypothesized about the price to book ratio. A lower price to book ratio could be a sign the company is undervalued. Therefore, I hypothesized that companies with a higher price to book ratio were less likely to survive. Another ratio I tested was the current ratio. A higher current ratio reflects that a company has enough current assets to meet short term obligations. I wanted to see if there was a trend with online companies that were unable to meet short term obligations and if this was correlated to failure rate. Finally, I looked into the operations of each company with the X variable pure online companies. If an online company had other means of generating revenue, such as catalogs or a brick and mortar store, I hypothesized that the company would have a higher chance of survival. Pure online companies with only online operations had one revenue stream; therefore, I made the assumption that due to the narrow revenue stream the chance of failure was higher.

The first time I ran the regression, the results came out unexpectedly. An issue with the data seemed to have skewed the results. I realized the companies that "died" before 2005 were overpowered by the survivors; therefore, the results were incorrect. To adjust for the data error, I copied the last year data of the companies that did not survive and repeated the final year data until 2005. The new surviving company data no longer overshadowed the companies that did not survive. After running the regression with the change, I achieved the following results (refer to Appendix A4). The shaded rows represent significant variables. An X-variable was significant if the t Stat was greater than

or equal to the absolute value of two. The R Square, or coefficient of determination, is a measure of how close the data fits to the regression line. In the case of the data analysis I conducted, I achieved an R Square of 17.4%. A low R Square is not ideal; however, the R Square would improve by using a logistic regression or probit model. Generally, the linear regression used for my research will produce the same results as the logistic regression or probit. From the linear regression results, I drew a number of conclusions.

#### **Part IV: Discussion**

The conclusions drawn from the linear regression are summarized in A3. One of the conclusions was if a company had negative earnings, then it was more likely to go out of business during the dot-com bubble burst. Earnings are one of the main factors of share price. Investors look to see how much profit a company can achieve. Investor satisfaction with a company's earnings will determine the success of a company's future. Therefore, if a company had negative earnings during the time period 1998 through 2005, then the company was more likely to fail. Earnings per share is how much of a company's profit is allocated to each outstanding share. This X-variable also explained the conclusion that a company with lower earnings was more likely to fail.

Based on the previous research on this topic, I was surprised by the fact that if a company had ".com" in the name, then it was more likely to fail. However, I concluded that investors had a negative perception of dot-com companies after the NASDAQ crashed. Because of the negative perception, dot-com companies struggled to receive equity funding. Another reason for the higher chance of failure associated with the .com name stems from the idea that companies changed their name at the last moment in an

attempt to boost their stock price. The name change was a last-ditch effort before finally failing.

Another contributor to the success or failure of a company was price volatility. I measured price volatility as the change between high and low stock prices for the year divided by the average price of the stock in that year. The more volatile a company's stock, the lower the chance of survival. I expected the price volatility conclusion based off of my initial hypothesis. Another expected conclusion was that companies that spent more on advertising had a lower chance of survival. Companies poured millions into advertising each year to try and gain notoriety. Pets.com is a company that exemplified the high advertising costs during the dot-com era. Pets.com had not established its business and did not have real profits to show, and yet the company felt comfortable spending exorbitant amounts of money on commercials.

I also tested to see if company shares outstanding had an effect on survival. The theory behind testing for common shares outstanding was that a company with greater shares outstanding had a broader investor base. Another theory is that the company IPO was more successful if it had greater shares outstanding. Issuing more shares normally sends a negative signal to the market. However, I felt that in the case of a dot-com company more shares directly related to how successful a company's IPO was. The broader investor base also was a positive factor for a company. In the event of a large sell off in the market, a company with a broader investor base has a more diversified source of equity financing.

Another X-Variable I tested was the business structure of online firms. Companies that operated solely online were less likely to survive than companies that had

operations in a catalog or brick and mortar store. Companies with a broader business model maintained revenue streams in the event the internet business failed. Many online companies did not figure out how to expand their customer base online. The internet was too new, and companies were unable to turn a profit from their sales. If a company had other operations besides a pure online business, it could rely on the alternative parts of the business to help increase profits. An example of this is Lands End, which operated its business via brick and mortar stores, catalogs, and online. It was able to withstand the dot-com bubble burst, despite having a major online presence.

I achieved conclusive results utilizing a linear regression model; however, other results were statistically insignificant. Some of these insignificant results came as a surprise. For example, market value was an X-variable I felt played a role in the likelihood of whether or not a company survived the dot-com era. However, market value did not end up as a significant factor. One of the reasons market value did not play a major role was because many companies were of the same size in the dot-com era. The share prices were all high, and the companies had similar shares outstanding. Market value was not a variable that either helped or hurt a company during the dot-com bubble burst. Another surprising statistically insignificant result was the debt/market cap. I felt that the greater portion of debt relative to a company's market cap would be a characteristic that set the company up for failure. The reason behind my hypothesis was that at the time debt was a relatively cheap financing vehicle for companies due to the lower interest rates. As interest rates began to rise, investor money stopped flowing in and the market crashed. As a result, online companies ran out of financing options.

This study has several limitations. As previously mentioned, the linear regression model only produced an R Square of 17.4%. Therefore, to truly be able to certify that my results describe the majority of the data, a logistic model or probit model needs to be run. Another limitation is the sample. I created the sample based on the SIC codes of Amazon and eBay. At the time, Amazon and eBay online businesses were new. Because of how new the online space was, for online businesses to obtain a clear classification was difficult. Additionally, I had difficulty ensuring that my sample contained every single public company in operation during 1998 through 2005. Another limitation was the difference in the length of time for which a company was in operation. In order to ensure the companies that went out of business were not over powered, I had to replicate the data for their last year in operation. Replicating the last year of data up until 2005 increased the accuracy of the final results. The reason behind the increased accuracy was because, initially, the survivors' data overpowered and skewed the results.

Other future studies could be completed on this topic, specifically to eliminate the limitations previously discussed, or to identify every single public online company in operation during 1998 – 2005. Obtaining every single online public company would produce slightly different results than the study I performed on 180 companies. Additionally, an interesting study would be to examine pure online companies. I extracted companies that had both online and other business operations. If a researcher chose to perform a study with only pure online companies, it would be helpful for market participants to see the difference in how the X-variables react in the linear regression model. Another interesting study could be performed on current online companies to see if those companies have similar characteristics to the companies that failed as a result of

the dot-com bubble burst. There are few limitations to additional research that could be performed on this topic.

## **Part V: Implications**

This thesis is relevant to both academics and non-academics. Any person with an investment in the public market should understand the effects of bubbles in the market and should understand the history of the stock market. In understanding what happened in the past, hopefully current investors can avoid falling into the same pattern witnessed during the dot-com era. The investors who hopped on the bandwagon and invested in a majority of dot-com companies learned the lesson the hard way. From my research and conclusions, I hope that other investors understand the importance in identifying characteristics that are troubling for a company. Additionally, the conclusions from my study can be utilized to identify characteristics to be wary of as an investor in the stock market today. Negative earnings, extreme price volatility, high advertising expenditures, and concentrated revenue streams are all characteristics I found to be harmful to the future performance of online companies.

My advice to market participants, whether they are their own money or managing money on behalf of someone else, is to be aware that fundamental value is important. Trendy investments are not always winners, especially when investors hop on the trend late. Additionally, look deeper into the past and what went wrong so that the same mistakes can be avoided. While today's young investors may not have been around during the dot-com era, they should understand what went wrong. The greatest way to learn is by losing money. If an investor did not lose money on an investment, then the greatest way to learn is by looking at how others lost money in the market. In the case of

the dot-com era, many investors lost money and will forever be cognizant of companies with no real fundamental value or true business plan.

## **Part VI: Conclusion**

In summary, my thesis attempted to shed light on the dot-com bubble, the online companies that either survived or failed, and the significant characteristics that played a role in a company's survival. Many other researchers studied the dot-com era and the companies that played a major role in the bubble that formed. The previous research focused on name changes, IPO returns, and a variety of factors that played a role in a company's failure or success. However, the X-Variables I studied were unique to this manuscript and were only influenced by previous research. Recently, the debate amongst investors on how to truly value a company, such as Amazon, sparked my interest in pursuing this topic. The current environment with certain technology stocks and their high valuations is an issue about which investors are concerned, and I believe their concern is with good reason.

In writing this thesis, I explored the dot-com bubble and the companies in operation during the dot-com era. I was able to explore investors' rationale for investing in these high risk firms with no fundamental value. I then was able to gain enough knowledge through looking at other research to come up with my own study and question pertaining to the topic. Finally, I was able to draw several conclusions about characteristics that negatively or positively affected online companies during the dot-com era.

After performing this study, I was able to address many of my questions and hypotheses relating to dot-com companies. I created my sample utilizing the Wharton Research Data Services, SIC codes of Amazon and eBay, and Bloomberg to conduct research on each company. I narrowed my final sample by removing duplicates, companies not in operation before March 10, 2000, and companies that had no online operations. I ran a linear regression to identify the X-Variables that were significant in the survival or failure of each online company in my sample. My results revealed a few conclusions about the companies in the dot-com era including (1) companies with negative earnings had a lower chance of survival; (2) companies with “.com” had a lower chance of survival; (3) companies with more volatile stock prices had a lower chance of survival; (4) companies that had higher advertising expenses had a lower chance of survival; (5) companies with higher shares outstanding had a higher chance of survival; and (6) companies with pure online operations had a lower chance of survival.

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## Appendix A

**Table A1**

### Companies included in linear regression

1 HANOVER DIRECT INC	41 CREDIT MGMT SOLUTIONS INC	81 EBAY INC	121 PERSISTENCE SOFTWARE INC	161 NETCREATIONS INC
2 BLAIR CORP	42 MC INFORMATICS INC	82 DICE INC	122 COMMERCE ONE INC	162 RAINMAKER SYSTEMS INC
3 SERVICE MERCHANDISE CO	43 SEEC INC	83 ABLEAUCTIONS.COM INC	123 I D SYSTEMS INC	163 QUINTUS CORP
4 SPIEGEL INC -CL A	44 CAREDATA.COM INC	84 NBC INTERNET INC	124 NFRONT INC	164 IMANAGE INC
5 MARKET GUIDE INC	45 TEMPLATE SOFTWARE INC	85 INTERNET AMERICA INC	125 SHOWCASE CORP	165 KOREA THRUNET CO LTD
6 LANDS END INC -OLD	46 METRO INFORMATION SVCS INC	86 CLAIMSNET.COM INC -OLD	126 CYREN LTD	166 RETEK INC
7 LILLIAN VERNON CORP	47 QUALIX GROUP INC	87 MARKETWATCH INC	127 ASK JEEVES INC	167 MEDIAPLEX INC
8 COGNOS INC	48 ILOG SA	88 MOMENTUM BUSINESS APPS INC	128 BE INC	168 AGENCY.COM LTD
9 SPORT SUPPLY GROUP INC	49 IONA TECHNOLOGIES PLC	89 CYBEAR GROUP	129 LIVEWORLD INC	169 OFFICIAL PAYMENTS CORP
10 FORSOFT LTD	50 ZEROPLUS.COM INC	90 PACIFIC INTERNET LTD	130 VOYAGER.NET INC	170 PFSWEB INC
11 ELECTRONIC CLEARING HOUSE	51 BRYLANE INC	91 WEBTRENDS CORP	131 HOOVERS INC	171 OPENTV CORP
12 COREL CORP	52 EGGHEAD.COM INC	92 MULTEX.COM INC	132 PRISM TECHNOLOGIES GROUP INC	172 DIGIMARC CORP -OLD
13 INFORMATION ANALYSIS INC	53 GO2NET INC	93 ABOUT.COM INC	133 N2H2 INC	173 HRSOFT INC
14 SPORT SUPPLY GROUP INC -OLD	54 AMAZON.COM INC	94 ONEMAIN.COM INC	134 ACTUA CORP	174 HEALTHCENTRAL.COM
15 EVINE LIVE INC	55 REIS INC	95 CRITICAL PATH INC	135 FTD.COM INC	175 NETRATINGS INC
16 FRANKLIN COVEY CO	56 GLOBALNET FINANCIAL.COM INC	96 PRICELINE GROUP INC	136 PIVOTAL CORP	176 EL SITIO INC
17 MKTG INC	57 PEAPOD INC	97 DELIAS INC	137 INTERWORLD CORP	177 FREEMARKETS INC
18 BLACK BOX CORP	58 PEGASUS SOLUTIONS INC	98 USINTERNETWORKING INC	138 U S INTERACTIVE INC	178 MEDICALOGIC/MEDSCAPE INC
19 SPECTRUM GROUP INTL INC	59 FINE.COM INTERNATIONAL CP	99 LOG ON AMERICA INC	139 INTERNET GOLD-GOLDEN LINES	179 ONDISPLAY INC
20 CONCENTREX INC	60 SYNTEL INC	100 LAUNCH MEDIA INC	140 NETSCOUT SYSTEMS INC	180 XPEDIOR INC
21 MEDCOM USA INC	61 INSPIRE INS SOLUTIONS INC	101 MARIMBA INC	141 LUMINANT WORLDWIDE CORP	
22 PCM INC	62 UBICS INC	102 MAPQUEST.COM INC	142 MEDSCAPE INC	
23 MUSTANG.COM INC	63 SPORTSLINE.COM INC	103 NETOBJECTS INC	143 HEADHUNTER.NET INC	
24 CLICKACTION INC	64 3DSHOPPING .COM	104 BIZNESSONLINE.COM INC	144 LIONBRIDGE TECHNOLOGIES INC	
25 SYSTEMAX INC	65 MAREX INC	105 CAREERBUILDER INC	145 PURCHASEPRO.COM	
26 WAYSIDE TECHNOLOGY GROUP	66 1-800 CONTACTS INC	106 BANKRATE INC	146 VITRIA TECHNOLOGY INC	
27 NETSCAPE COMMUNICATIONS	67 PC CONNECTION INC	107 ALLOY INC	147 E.PIPHANY INC	
28 PREMIERE GLOBAL SERVICES INC	68 ESOFTE INC	108 SCIENT CORP	148 EGAIN CORP	
29 EARTHLINK HOLDINGS CORP	69 FACTUAL DATA CORP	109 INTERLIANT INC	149 UNITED ONLINE INC	
30 SIMPLAYER.COM LTD	70 COM21 INC	110 EDGAR ONLINE INC	150 CALICO COMMERCE INC	
31 PAYMENTTECH INC	71 VOICEFLASH NETWORKS INC	111 JUNO ONLINE SERVICES INC	151 QXL RICARDO PLC	
32 STYLECLICK.COM INC	72 INTERPLAY ENTERTAINMENT COR	112 ZIPLINK INC	152 LTWC CORP	
33 ZONES INC	73 INKTOMI CORP	113 ONLINE RESOURCES CORP	153 INTERWOVEN INC	
34 CONNECTINC.COM CO	74 CASH TECHNOLOGIES INC	114 DRKOOP.COM INC	154 CYSIVE INC	
35 MEDICONSULT.COM INC	75 IENTERTAINMENT NETWORK INC	115 STREAMLINE.COM INC	155 SIFY TECHNOLOGIES LTD -ADR	
36 VERTRUE INC	76 BROADCAST.COM INC	116 SALON MEDIA GROUP INC	156 VIADOR INC	
37 SMALLWORLDWIDE PLC -ADR	77 BINDVIEW DEVELOPMENT CORP	117 VIANT CORP	157 PREDICTIVE SYSTEMS INC	
38 HOPTO INC	78 TOWNE SERVICES INC	118 MAXUS TECHNOLOGY CORP	158 GAIA INC	
39 FORRESTER RESEARCH INC	79 DATALINK CORP	119 CYBERSOURCE CORP	159 COLLECTORS UNIVERSE INC	
40 THINK NEW IDEAS INC	80 ECLIPSY CORP	120 US SEARCH.COM INC	160 EBOOKERS PLC	

Table A2

## Regression Output

<b><i>Regression Statistics</i></b>	
Multiple R	0.4170
R Square	0.1739
Adjusted R Square	0.1635
Standard Error	0.4036
Observations	1313

	<b><i>Coefficients</i></b>	<b><i>Standard Error</i></b>	<b><i>t Stat</i></b>	<b><i>P-value</i></b>	<b><i>Lower 95%</i></b>
Intercept	0.6810	0.0410	16.6073	0.0000	0.6006
EPS<0	-0.1855	0.0303	-6.1161	0.0000	-0.2449
Revenue	0.0000	0.0000	0.9935	0.3207	0.0000
.Com in the Name	-0.0920	0.0392	-2.3482	0.0190	-0.1689
Market Cap	0.0000	0.0000	1.0917	0.2752	0.0000
Price Volatility	-0.1743	0.0274	-6.3566	0.0000	-0.2280
Advertising Expense	-0.0011	0.0003	-3.4907	0.0005	-0.0017
Debt/Market Cap	0.0109	0.0279	0.3893	0.6971	-0.0439
Debt/Equity	0.0030	0.0083	0.3577	0.7206	-0.0133
Total Debt	0.0002	0.0001	1.6907	0.0911	0.0000
Price to Book	0.0001	0.0002	0.4258	0.6703	-0.0003
Common Shares Outstanding	0.0007	0.0003	2.2430	0.0251	0.0001
Pure Online Business	-0.0960	0.0250	-3.8458	0.0001	-0.1450
EPS	0.0098	0.0038	2.5747	0.0101	0.0023
Current Ratio	0.0010	0.0024	0.3925	0.6948	-0.0038
Current Assets	0.0000	0.0002	-0.1041	0.9171	-0.0003

Table A3

Summary of X variables and results

X Variables	Hypothesis	Conclusion
Earnings < 0, 1 = Yes	Earnings < 0, less likely to survive	TRUE
Revenue	Higher revenue, more likely to survive	Statistically Insignificant
.Com in the Name, 1 = Yes	.Com in the name, more likely to survive	FALSE
Market Value (Shares Outstanding x Stock Price)	Higher market value, more likely to survive	Statistically Insignificant
Asset Turnover	Higher asset turnover, more likely to survive	Statistically Insignificant
Price Volatility (Price Volume/Avg. Price)	Higher price volatility, less likely to survive	TRUE
Advertising Expense	Higher advertising expense, less likely to survive	TRUE
Total Debt/Market Cap	Higher debt/market cap, less likely to survive	Statistically Insignificant
Debt/Equity	Higher D/E ratio, less likely to survive	Statistically Insignificant
Total Debt	Higher Debt, less likely to survive	Statistically Insignificant
Price/Book (Avg. Share Price/Book Value)	Higher price to book, less likely to survive	Statistically Insignificant
Common Shares Outstanding	Higher shares outstanding, more likely to survive	TRUE
Pure Online Business, 1 = Yes	Pure online business, less likely to survive	TRUE
Earnings Per Share	Higher earnings per share, more likely to survive	TRUE
Current Ratio (Current Assets/Current Liabilities)	Higher current ratio, more likely to survive	Statistically Insignificant
Current Assets	Higher current assets, more likely to survive	Statistically Insignificant